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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER
STAHL, MICHAEL J

ART UNIT	PAPER NUMBER
2874	

DATE MAILED: 08/28/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application N .	Applicant(s)	
	09/745,033	JIANG ET AL.	
	Examiner	Art Unit	
	Mike Stahl	2874	

-- The MAILING DATE of this communication appears on the cover sheet with th correspondence address --

P ri d for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *60-99* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *60-99* is/are rejected.

7)☒ Claim(s) *85 and 92* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☒ The proposed drawing correction filed on *20 December 2000* is: a)☒ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *4,5* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

Drawings

1. The proposed drawing changes submitted December 20, 2000 are approved by the examiner.

Information Disclosure Statement

2. The hundreds of references cited on the information disclosure statements filed December 20, 2000 and June 27, 2002 have been considered and made of record. Initialed copies of the citation forms are attached. It is noted that nearly all the cited references are not material to the patentability of this application.

Claim Objections

3. Claims 85 and 92 are objected to because of the following informalities: Claim 85 should depend from claim 84 since claim 83 does not mention an internal shield. Claim 92 should depend from claim 91 since no emitter is mentioned in claim 84. Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 60, 62, and 67-73 are rejected under 35 U.S.C. 102(b) as being anticipated by Chen et al. (US 5337396).

Chen discloses a fiber optic module comprising a first optoelectronic device **16** to couple photons into or out of an optical fiber, a first printed circuit board **20** coupled to the first optoelectronic device parallel to the axis of that device, and having a number of pins **20c**, and a conductive plastic housing **11** around the circuit board to provide electromagnetic shielding. Thus the Chen module anticipates claim 60. As for claim 62, the terms "vertical" and "horizontal" as used in this claim are relative terms, so that the printed circuit board will be vertical and perpendicular to a horizontal plane depending upon a given choice of reference directions. As for claims 67-69, the shielded housing is coupled to ground by coupling to a system ground and via a trace on the printed circuit board which is connected to one of the pins **20c** (col. 3 lines 12-43; col. 6 lines 13-23). As for claims 70 and 71, the shielded housing includes a base **12** through which the circuit board pins extend. As for claims 72 and 73, the module includes a conductive nose **15** which receives a fiber optic connector and provides electromagnetic shielding.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 61, 66, 74-80, 82, 94, 96-97, and 99 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. (cited above).

As to claim 61, in the illustrated embodiment the terminals **16a-16c** of the optoelectronic device **16** are coupled to pads **20d** which are all on the same side of circuit board **20**. However, it is apparent that Chen's teachings are not limited to this specific arrangement. Note that the circuit board **20** is double-sided and has electronic components and traces on both sides (col. 2 lines 50-59; col. 4 line 64 – col. 5 line 10). Thus it would have been obvious to a person having ordinary skill in the art to couple one or more of the terminals to the opposite side of the circuit board depending upon both the layout of the terminals for a particular optoelectronic device package and the available circuit space on the board. As to claim 66, although Chen does not appear to disclose any lenses, it would have been obvious to a skilled worker to include a lens in the Chen module since lenses are routinely used to improve the efficiency of coupling between optical fibers and optoelectronic devices.

Regarding claims 74 and 94, it would have been obvious to a person of ordinary skill in the art to include a second printed circuit board having a second optoelectronic device in the Chen module since there are many applications in which it is necessary to provide both a transmission and a reception function. It is notable that Chen also suggests the possibility of employing alternative connector arrangements (col. 6 lines 9-15). As to claims 75 and 99, the placement of terminals of the second optoelectronic device would have been obvious in the same manner as the placement of terminals of the first optoelectronic device (as explained above with respect to claim 61). As to claims 76 and 77, the Chen module includes a base **12** through which the pins of the both printed circuit boards would extend. As to claims 78 and 79, the module

includes a nose **15** which provides shielding and receives a fiber connector. Given that the Chen module was modified to include a second optoelectronic device, it would have been necessary and straightforward to modify the nose to accommodate a second optical connector.

Regarding claims 80 and 97, the recited orientations are relative and are satisfied depending on the choice of coordinate axes as previously asserted with respect to claim 62. As to claims 82 and 96, it would have been obvious to a skilled artisan to provide an internal shield between the two printed circuit boards in the proposed modification since this would augment the shielding provided by the conductive plastic housing, i.e. the housing blocks EMI from external sources while an internal shield would block EMI from sources within the housing.

8. Claims 60-66, 70-71, 74-77, and 80-99 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wolf (US 6024500) in view of Benzoni (EP 0652696 A1).

Wolf discloses a fiber optic module **10** comprising first and second optoelectronic devices **22** and **32** to couple light into or out of first and second optical fibers, and first and second printed circuit boards **21** and **31** which coupled to the first and second devices and are parallel to their respective optical axes, and which include pins **25** and **35** inserted through openings in a base **14**. Both circuit boards **21** and **31** are perpendicular to the base **14**. The module also includes a housing **11** which is disclosed as a dielectric material, generally plastic. The Wolf module meets every limitation of independent claims 60, 83, and 94 except that its housing is not specifically designed to provide EMI shielding.

Benzoni also discloses a fiber optic module having a dielectric housing, but teaches that portions of the housing may be coated with a conductive material in order to provide EMI

shielding (abstract; col. 3 line 53 – col. 4 line 50). Benzoni further teaches that this approach avoids known problems with forming and assembling metal housings (background). Accordingly, it would have been obvious to a person having ordinary skill in the art to modify the Wolf module by simply providing an appropriate conductive coating in the manner taught by Benzoni to provide shielding from external EMI sources. The proposed modification would have satisfied independent claims 60, 83 and 94 as well as dependent claims 70-71, 74, 76-77 and 95.

As to claims 61, 75, 93, and 99, figs. 2 and 3 appear to depict terminals along both sides of each optoelectronic device **22** and **32**, with some terminals of each device being coupled to the upper side of their respective circuit boards **21** and **31** and other terminals being coupled to the opposite (lower) side of the boards. As to claims 62, 63, 80, 81, 87, 88, 97, and 98, the circuit boards **21** and **31** are vertical circuit boards perpendicular to a horizontal plane, the optical axes of the devices are parallel to the horizontal plane, and the boards are perpendicular to a system circuit board **15** when the module **10** is mounted thereto. Regarding claim 64, the pins **25** of the first circuit board couple to the system board **15** (col. 2 lines 21-24). As to claim 65, although Wolf does not show a connector on the system board **15** for pins **25**, it would have been obvious to provide such a connector since it would be impractical to perform a one-by-one electrical connection of the pins to the system board circuitry when there is an appreciable number of pins.

Regarding claims 82, 84-85, and 96, Benzoni discloses an internal shield **52** which is used to prevent crosstalk between a transmitter component **72** and a receiver component **76**. The shield may extend between the transmitter and receiver when they are mounted on separate substrates. Since Wolf also uses a transmitter and a receiver mounted on separate circuit boards,

it would have been obvious to a skilled worker to provide an internal shield between the boards as taught by Benzoni in order to reduce interference between them.

As to claims 66 and 86, Wolf indicates that the laser module **22** and the photodetector module **32** typically include lenses (col. 1 line 66 – col. 2 line 2). As to claim 91, device **22** is an emitter and device **32** is a receiver. Regarding claim 92, although Wolf cites an edge emitting laser in the exemplary embodiment, it is noted that other laser types are contemplated (col. 2 lines 31-34). It would have been obvious to a practitioner of the art to specifically choose a VCSEL as the laser because it is known that VCSELs have comparatively high efficiencies.

As to claim 89, Wolf discloses individual noses **23** and **33** for aligning fibers with the laser module **22** and the photodetector module **32**. It appears that a common nose to handle both fiber connectors simultaneously is within the scope of the Wolf disclosure. As to claim 90, it would have been obvious to a skilled artisan to provide the nose with shielding since the nose constitutes an additional entry point for external EMI.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 6213651 is the patent which issued on the parent application.

11. Any inquiry concerning this communication should be directed to Mike Stahl at (703) 305-1520. Inquiries of a general or clerical nature (e.g., a request for a missing form or paper, etc.) should be directed to the Technology Center 2800 receptionist at (703) 308-0956 or to the technical support staff supervisor at (703) 308-3072.

MJS

Michael J. Stahl
Patent Examiner
Art Unit 2874

August 15, 2002

Rodney Bovernick
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Technology Center 2800